

Date: Mon, 31 Jan 94 04:30:54 PST  
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>  
Errors-To: Ham-Homebrew-Errors@UCSD.Edu  
Reply-To: Ham-Homebrew@UCSD.Edu  
Precedence: Bulk  
Subject: Ham-Homebrew Digest V94 #15  
To: Ham-Homebrew

Ham-Homebrew Digest                      Mon, 31 Jan 94                      Volume 94 : Issue    15

Today's Topics:

          Antenna pre-amp design. Help!  
          Antenna Tuner Project Advice Needed  
          High Voltage Power Supply  
          Old Radio Elec/Pop Elec Magazines  
          Oscillators using MMIC's Amps  
PROJECT 14: THE WORLD'S SMALLEST TRANSMITTER (2 msgs)  
          Reciprocal mixing at 25 kHz, ICF-2010 Help! (2 msgs)  
                  spot my transistor.  
          The World's Smallest Receiver  
          want to build reciever for 108-137Mhz

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>  
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>  
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available  
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

We trust that readers are intelligent enough to realize that all text  
herein consists of personal comments and does not represent the official  
policies or positions of any party. Your mileage may vary. So there.

-----  
Date: Sat, 29 Jan 1994 19:58:22 GMT  
From: sdd.hp.com!usc!elroy.jpl.nasa.gov!swrinde!emory!gatech!udel!  
news.intercon.com!psinntp!psinntp!psinntp!arrl.org!zlau@network.ucsd.edu  
Subject: Antenna pre-amp design. Help!  
To: ham-homebrew@ucsd.edu

asirene@ntuvax.ntu.ac.sg wrote:  
: Hi,

: Can anyone here give me some advice on building an antenna pre-amp  
: for working 4 - 24 mHz? Should I go broadband or switched bands? What about  
: pre-filtering?

The front end input preamplifier on page 25 of the February 1993 QST might be a good compromise, offering 8 dB of gain and a 2 dB noise figure. There is a good chance it will cover the entire 4 to 24 MHz spectrum as is. A deficiency of this design is the necessity for good output matching--a poor output match will degrade performance.

I prefer to use narrowband, fixed tuned filters, though there are advocates of tunable filters.

: What are the advantages of designing one around bi-polar or mosfet?  
: Can anyone contribute some tried and tested circuits for me to construct?

A problem with designing low noise HF preamps is that few, if any, devices are optimized for this task. MOSFETs were primarily designed for use at VHF and low UHF--specifications on HF noise figures seem non-existent. I suspect that were someone to invest the \$\$\$ for a really optimized device, sub 0.5 dB NFs are possible. Occasionally, you can find bipolars optimized for low VHF, such as the NEC 41603/2SC1949, touted as having a 1 dB NF at 70 MHz. The usual problem is excessive gain, which requires some form of lossless feedback to reduce without degrading noise figure. Theoretically, directional couplers could be used to implement feedback, but I've not seen published circuits to duplicate.

--

Zack Lau KH6CP/1                    2 way QRP WAS  
                                     8 States on 10 GHz  
Internet: zlau@arrl.org    10 grids on 2304 MHz

-----

Date: 27 Jan 1994 15:34:50 GMT  
From: usc!cs.utexas.edu!utah-morgan!hellgate.utah.edu!fcom.cc.utah.edu!  
u.cc.utah.edu!titan.wordperfect.com!xmb!mb@network.ucsd.edu  
Subject: Antenna Tuner Project Advice Needed  
To: ham-homebrew@ucsd.edu

Bruce Pea (pea@wri.com) wrote:

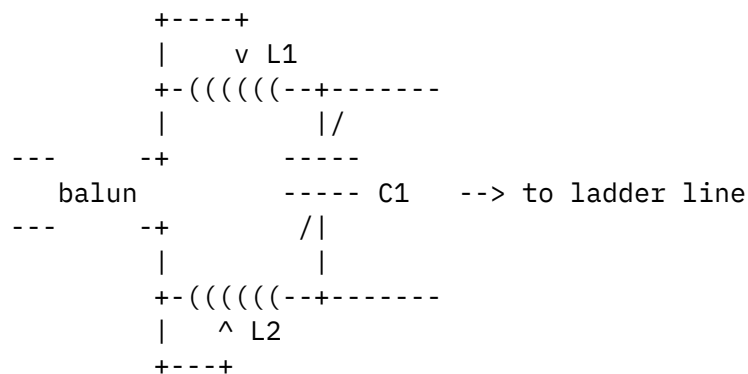
: I'm getting ready to put a dipole up and use ladderline to  
: feed it. I'm going to need an antenna tuner so I can tune  
: this wire across 160-10m.

: I thought building a tuner would be a nice winter project.  
: Do any of you have a favorite tuner project you would like  
: to point me to?? My rig is an ICOM IC-740, 100 watts out.

: Thanks for the help!

: Bruce

Richard Measures, AG6K, wrote an article in the Feb. 1990 QST about a balanced antenna tuner, made for just such an antenna system as you describe. The balun is at the input of the tuner (i.e., between the transmitter and the tuner). The tuner itself consists of two roller inductors for the series reactances and a variable capacitor for the shunt reactance.



The roller inductors are mechanically ganged by a belt and pulleys on the inductor shafts. The idea of a balanced tuner feeding a balanced transmission line to a balanced antenna is appealing...

--  
Michael Bendio        WT7J            mb@titan.wordperfect.com            801 222-5367  
Opinions are my own and aren't necessarily shared by Wordperfect Corporation

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Date: Sat, 29 Jan 1994 00:20:52 GMT  
From: ucsnews!sol.ctr.columbia.edu!howland.reston.ans.net!gatech!swrinde!sgiblab!  
sgigate.sgi.com!olivea!news.bu.edu!news.bbn.com!petra!zds-oem!  
news@network.ucsd.edu (Earl Morse)  
Subject: High Voltage Power Supply  
To: ham-homebrew@ucsd.edu

In article <CKArGG.En5@cup.hp.com> jholly@cup.hp.com (Jim Hollenback) writes:  
>Martin Stille (msti0087@rz.uni-hildesheim.de) wrote:  
>: Hi OM's  
>  
>: I need a high voltage power supply for a tube PA.  
>: But I can't find the right schematic and part list.  
>: The tube runs with a current of 7000V and 2Amp.  
>: I hope you can help me.  
>: Thank's Martin  
>  
>hmmm, 7kv x 2 amp, about 14kw on the plate....thats one healthy afterburner.

>You should be worried about the coax feed also.

>

Even at 50 percent efficiency that will take out just about any commercially available ham antenna and the standard feed lines. Serious competition for Peter I this week though.

Earl Morse  
KZ8E  
e.morse@zds.com

-----  
Date: 27 Jan 94 06:54:07 GMT  
From: ucsnews!sol.ctr.columbia.edu!howland.reston.ans.net!vixen.cso.uiuc.edu!  
uchinews!msuinfo!harbinger.cc.monash.edu.au!bruce.cs.monash.edu.au!merlin!  
mel.dit.csiro.au!its.csiro.au!dmssyd.syd  
Subject: Old Radio Elec/Pop Elec Magazines  
To: ham-homebrew@ucsd.edu

There has been some activity at around 150 kHz in Australia and New Zealand. Circuit diagrams and construction notes has been published in Amateur Radio, which is official WIA magazine. I don't have any exact references at hand, but some articles has appeared during 1993. You can get copies of this journal from WIA: Amateur Radio, P.O.Box 300, Caulfield South, VIC 3162, Australia.

The only reference at hand is: Lloyd Butler (VK5BR, addr. 18 Ottawa Avenue, Panorama, SA 5401, Australia) - A Bandwidth Limiting LF Up Converter for Frequencies Around 200 kHz. Amateur Radio, December 1993, p. 4-7

In fact, this article contains references to: Butler - VLF-LF and the Loop Aerial, (aerial is antenna here ...) Amateur Radio, Aug. 1990 and John Adcock (VK3ACA) - The day we crossed the Tasman on Long Wave, Amateur Radio, April 1993 (Crossing Tasman sea means contact to NZ)

I have faint idea about these US magazines. The LF articles were quite good, but in this respect I can not help.

I hope this helps.

Sakari Mattila	smattila@metz.une.edu.au	The University of New England
(VK2XIN, OH2AZG)	tel. +61 67 733752	Armidale NSW 2351, Australia
P.O.Box u13	-----	
Armidale NSW 2351		

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Date: 27 Jan 94 07:02:21 GMT  
From: ucsnews!sol.ctr.columbia.edu!howland.reston.ans.net!vixen.cso.uiuc.edu!  
uchinews!msuinfo!harbinger.cc.monash.edu.au!bruce.cs.monash.edu.au!merlin!  
mel.dit.csiro.au!its.csiro.au!dmssyd.syd  
Subject: Oscillators using MMIC's Amps  
To: ham-homebrew@ucsd.edu

There was a series of articles about VHF - UHF crystal oscillators  
build around MMIC amplifiers (Mini-Circuit, Avantek and some Japanese  
ICs) in the RF Design (USA) journal about 1989 - 1992, most probably  
1991. The main idea was to make the oscillator to work directly at 100  
- 500 MHz. In some circuits, the author used special, low capacitance  
crystals.

Sakari Mattila	smattila@metz.une.edu.au	The University of New England
P.O.Box u13	tel. +61 67 733752	Armidale NSW 2351, Australia
Armidale NSW 2351	(VK2XIN, OH2AZG)	-----
Australia	-----	

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Date: Fri, 28 Jan 1994 15:13:57 GMT  
From: library.ucla.edu!europa.eng.gtefsd.com!howland.reston.ans.net!  
usenet.ins.cwru.edu!nshore!seastar!jjw@network.ucsd.edu  
Subject: PROJECT 14: THE WORLD'S SMALLEST TRANSMITTER  
To: ham-homebrew@ucsd.edu

As quoted from <2i2cdmINN5k6@abyss.West.Sun.COM> by myers@sunspot.West.Sun.COM  
(Dana Myers ):

> In article <CK0o0G.53D@news.Hawaii.Edu> jherman@uhunix3.uhcc.Hawaii.Edu (Jeff  
Herman) writes:

> >Gang,

> > If there was a contest to come up with a xmtr containing as few  
> >parts as possible, this would be the winner: 10 parts if you include  
> >the key, battery, and antenna!

>

> I can beat this.

Me too.

> > I built this for 80M only because I've got so many 3579 kHz crystals  
> >from old TV sets, but this can be used on any HF band - just choose  
> >L and C to resonant at the crystal frequency.

>

> Try using a 4049 or 74C04; use one inverter as a crystal osc (two  
> caps + crystal) and the other five in parallel as a buffer. Use a small  
> cap to couple the antenna, maybe 100pF. It'll run off 3-15V. Lessee..

> xtal+74C04+caps+battery+key+antenna = 8 parts.

>  
> The 74C04 was invented in something like 1973.  
    Try using a 28.322MHz oscillator (or a14 or 7 meg that I've  
seen occasionally that are still in the Ham bands). Low-pass filter  
this as well, and you need battery+key+oscillator+3xLPF components.  
Note that these oscillators are usually not a 50% duty cycle, so a  
bandpass filter would be better.  
> > For peace of mind you might want to add a bandpass filter to the  
> >output.  
>  
> or maybe a lowpass filter; that adds at least three more components.  
> The 74C04 approach would really benefit from an LPF, too.

Of course, taking that approach to extremes, use an Alinco  
DJ580. It is all one 'piece', including the battery, key and antenna  
;-)

--  
John Welch, N9JZW

-----  
Date: 25 Jan 1994 05:58:14 GMT  
From: unogate!news.service.uci.edu!usc!howland.reston.ans.net!cs.utexas.edu!  
swrinde!sgiblab!sgigate.sgi.com!olivea!korie!male.EBay.Sun.COM!  
newscast.West.Sun.COM!abyss.West.Sun.@mvpb.saic.com  
Subject: PROJECT 14: THE WORLD'S SMALLEST TRANSMITTER  
To: ham-homebrew@ucsd.edu

In article <CK0o0G.53D@news.Hawaii.Edu> jherman@uhunix3.uhcc.Hawaii.Edu (Jeff  
Herman) writes:

>Gang,  
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>L and C to resonant at the crystal frequency.

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The 74C04 was invented in something like 1973.

> For peace of mind you might want to add a bandpass filter to the  
>output.

or maybe a lowpass filter; that adds at least three more components.  
The 74C04 approach would really benefit from an LPF, too.

Oh, is this a CW issue? :-)

--

\* Dana H. Myers KK6JQ, DoD 466 | Views expressed here are  
\*  
\* (310) 348-6043 | mine and do not necessarily \*  
\* Dana.Myers@West.Sun.Com | reflect those of my employer  
\*  
\* This Extra supports the abolition of the 13 and 20 WPM tests \*

-----  
Date: Fri, 28 Jan 1994 23:11:03 GMT  
From: ucsnews!sol.ctr.columbia.edu!howland.reston.ans.net!newsserver.jvnc.net!  
raffles.technet.sg!ntuix!ntuvax.ntu.ac.sg!asirene@network.ucsd.edu  
Subject: Reciprocal mixing at 25 kHz, ICF-2010 Help!  
To: ham-homebrew@ucsd.edu

Hi,

I am experiencing reciprocal mixing of signals on my SONY  
ICF-2010/2001D at about 24 or 25 kHz above the actual signal image.  
Is there something i can do to fix this? Tks.

73 de 9V Daniel

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Date: 29 Jan 1994 15:50:53 GMT  
From: library.ucla.edu!agate!usenet.ins.cwru.edu!neoucom.edu!news.ysu.edu!  
yfn.ysu.edu!aj092@network.ucsd.edu  
Subject: Reciprocal mixing at 25 kHz, ICF-2010 Help!  
To: ham-homebrew@ucsd.edu

In a previous article, asirene@ntuvax.ntu.ac.sg () says:

>Hi,

>

> I am experiencing reciprocal mixing of signals on my SONY  
>ICF-2010/2001D at about 24 or 25 kHz above the actual signal image.

>Is there something i can do to fix this? Tks.

>

>73 de 9V Daniel

>

Steve Whitt mentions a rather detailed (but simple) fix in his book involving replacing or adding 3 or 4 capacitors in the radio's IF section. It DOES involve moving a shield and some pretty detailed solder work so it isn't for the feint of heart or those with limited soldering experience though!

Has ANYONE reading this group done the mod to see how it performs? I haven't yet -- and have been trying to see if anyone else has before I tackle it to see if it really does make a difference. I have been getting more and more annoyed by the background "rumble" on 49 metres in the evenings here, and would like to try the mod sometime t see if it helps.

73 //kvz

--

kv zichi -->bz649@Cleveland.Freenet.edu

despite what the address above may say!

-----  
Date: 30 Jan 94 17:09:04 GMT

From: netnews.upenn.edu!netnews.noc.drexel.edu!dunx1.ocs.drexel.edu!dunx1!st92ba44@rutgers.rutgers.edu

Subject: spot my transistor.

To: ham-homebrew@ucsd.edu

hello all.

i'm working on a variable power supply (3-15V) for my sw radios. i've gotten my hands on what looks like a good schematic. however, being new at this, i can't figure out the (specific) transistors it requires. there are two: an NPN and a HEP 232.

the most convenient place for me to get such pieces is at a local radio shack. ..the catalog has alot of transistors...all marked either NPN or PNP. i haven't spotted a HEP 232 (?). which one do i need? it gives no voltage specs or anything. can i use just any old NPN? any help would be appreciated. thanks.

-----  
antonio gatta

st92ba44@dunx1.ocs.drexel.edu  
-----



Date: Sun, 30 Jan 1994 16:54:04 GMT  
From: sdd.hp.com!usc!howland.reston.ans.net!gatech!wa4mei.ping.com!ke4zv!  
gary@network.ucsd.edu  
Subject: The World's Smallest Receiver  
To: ham-homebrew@ucsd.edu

In article <1994Jan28.141856.24304@govonca.gov.on.ca> sivyerb@govonca.gov.on.ca  
(Bob Sivyer) writes:

>Jeff Herman's post about the world's smallest transmitter seems to have  
>stirred up considerable interest. Does anyone have a collection of simple  
>receiver circuits that could be paired with Jeff's transmitters. I would  
>like to build a QRP station but have been away from building things for some  
>time.

Ok, top this great low power AM reciever for parts count.

Long wire antenna coil  
-----) diode crystal earphone  
          )<----->|-----()--Gnd  
          )

Wind the coil on a toilet paper tube or a Quaker Oats box. The variable  
tap is the "tuning" adjustment. Volume is controlled by how deeply you  
stick the earphone in your ear. While this receiver is optimized for  
AM voice, it'll work for Morse too if the matching transmitter is spark.

Gary

--

Gary Coffman KE4ZV		You make it,		gatech!wa4mei!ke4zv!gary
Destructive Testing Systems		we break it.		uunet!rsiatl!ke4zv!gary
534 Shannon Way		Guaranteed!		emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244				

-----  
Date: 30 Jan 1994 08:01:09 GMT  
From: haven.umd.edu!news.umbc.edu!europa.eng.gtefsd.com!howland.reston.ans.net!  
vixen.cso.uiuc.edu!uwm.edu!caen!malgudi.oar.net!infinet!cyborg@ames.arpa  
Subject: want to build reciever for 108-137Mhz  
To: ham-homebrew@ucsd.edu

Chad Berthelson (berthec@osiris.cso.uiuc.edu) wrote:

: As the subject line says, I want a tunable receiver that will pick  
: up Air Bands (108-137 Mhz).

You can convert any standard Broadcast FM reciever to get Aircraft. To do  
so is a matter of spreading the tuning coil (a length of copper wire in a

coil, usually coated with wax) out pretty much as far as they can go. (Evenly spaced between the coils), which raises the frequency range, then using a small screwdriver, turn the pot (Little metal box with plastic screw in it) that's closest to the tuning coil until the most noise is heard on an un-used freq. That changes the mode from FM r/x to AM r/x.

You can get a cheap am/fm radio for about 10 bucks at Radio Shack.

Hope this helps!  
Kristopher Hurt  
cyborg@infinet.com

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Date: Thu, 27 Jan 1994 17:23:36 GMT  
From: mvb.saic.com!unogate!news.service.uci.edu!usc!howland.reston.ans.net!  
europa.eng.gtefsd.com!emory!wa4mei.ping.com!ke4zv!gary@network.ucsd.edu  
To: ham-homebrew@ucsd.edu

References <1994Jan25.191202.1@ntuvax.ntu.ac.sg>,  
<1994Jan26.001852.3038@ke4zv.atl.ga.us>, <2i66g2\$lo5@vixen.cso.uiuc.edu>m  
Reply-To : gary@ke4zv.atl.ga.us (Gary Coffman)  
Subject : Re: Antenna pre-amp design. Help!

In article <2i66g2\$lo5@vixen.cso.uiuc.edu> ignacy@ux2.cso.uiuc.edu (Ignacy Misztal) writes:

>gary@ke4zv.atl.ga.us (Gary Coffman) writes:

>>In article <1994Jan25.191202.1@ntuvax.ntu.ac.sg> asirene@ntuvax.ntu.ac.sg writes:

>>> Can anyone here give me some advice on building an antenna pre-amp  
>>>for working 4 - 24 mHz? Should I go broadband or switched bands? What about  
>>>pre-filtering?

>

>>Normally, a preamp is unnecessary for the HF spectrum. The usual problem  
>>is inadequate rejection of strong signals. However, if you've got an old  
>>deaf receiver, like say a S-28, a preamp may help. You definitely want to  
>>use a selective amplifier with good sharp tuned circuits. A triple ganged  
>>circuit would be a good idea. Otherwise your preamp will operate in overload  
>>most of the time.

>

>A preamp may be needed for upper bands if bands are quiet and antennas  
>not spectacular. A single tuned circuit would cut out a mirror frequency  
>pretty well. Once I build a one-transistor preamplifier with one tuned  
>circuit, and it made a large difference on my SWAN 500.

SWAN 500. Well yeah, a preamp could help a SWAN. :-)

>>> What are the advantages of designing one around bi-polar or mosfet?  
>>>Can anyone contribute some tried and tested circuits for me to construct?  
>  
>>FETs would be the more popular choice. You can tap up on the selective  
>>circuits for lighter loading, hence higher Q, with less problems with a  
>>FET. The old MPF102 would work for this type of circuit, but it can  
>>be driven rather easily into overload. A power VMOS FET like the VMP-4  
>>may be a better choice. Run about 100 ma of standing current.  
>  
>MOSFETs and FETS may have too low gain to drive the coax. Large-signal  
>properties of a RF amplifier are not terribly important, especially  
>with the tuned front. It is usually the mixer that is more susceptible to  
>overloading.

Actually, the problem with modern Mosfets is in taming the \*excess\* gain they possess. Many have 15-20 db of gain well into the gigahertz region, and gain suffers a 3 db increase for every octave frequency decrease. So at HF they're generally hotter than firecrackers. You don't want more than 10-15 db of gain in a preamp or you'll definitely overdrive most HF rigs into distortion and intermod. It's also a fact of life today that strong signal handling has become the major problem at HF. Using either very selective networks, or amplifiers with strong signal handling characteristics, or both, is a must. Most modern receivers use a DBM first mixer with +8 dbm or greater LO injection, so mixers aren't the weak link anymore.

>>In looking through my collection of ARRL Handbooks, I don't find a  
>>HF preamp until I go back to the 1962 edition. They have one using  
>>a 6AK5 pentode. This should give you an idea of the apparent lack  
>>of need for such circuits with more modern equipment.  
>  
>The problem of improper gain distribution in various stages is still a  
>problem. Look at smaller ICOMs, where you can hear plenty of noise from  
>the IF stages, particularly with a CW crystal filter in the first IF.  
>Intermods spoil the reception sometimes, but such a noise spoils it  
>much more often. Sometimes I would like to have more RF gain  
>in my IC-735 on 10-20m. Perhaps my antennas are not spectacular.

Indeed. With my IC-735, atmospheric noise dominates the quiet channel. Of course channels are rarely quiet. A good antenna is always a must for proper performance.

>>If the problem is that you are using a small voltage probe antenna,  
>>a FET configured as an emitter follower mounted directly on the  
>  
>>something more to the liking of the receiver and coax. Again run  
>>enough standing current to avoid overload problems.  
>

>Emitter followers driving a coax are excellent oscillators.

They can be, if not properly designed. But this is more a problem with low impedance bipolar circuits than with FETS. Adding additional degenerative feedback in the emitter circuit will tame this problem. The FET will have more gain than you want anyway, so this is a viable solution.

Gary

--

Gary Coffman KE4ZV		You make it,		gatech!wa4mei!ke4zv!gary
Destructive Testing Systems		we break it.		uunet!rsiatl!ke4zv!gary
534 Shannon Way		Guaranteed!		emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244				

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End of Ham-Homebrew Digest V94 #15

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